World Journal of Advanced Research and Reviews
eISSN: 2581-9615 CODEN (USA): WJARAI
Cross Ref DOI: 10.30574/wjarr
Journal homepage: https://wjarr.com/

(CASE REPORT)

Emphysematous cystitis about a case

Zackaria Ba [1, 2, *], M. amine Malki [1], A. Geralde [2], M. Amri [2], H. Harb [2], I. Charifi [2], MJ EL Fassi [1] and MH Farih [1]

[1] *Department of urology, University Hospital Center Hassan II of Fez, Morocco.*
[2] *St Mihiel hospital center in Verdun, France.*

World Journal of Advanced Research and Reviews, 2023, 20(02), 226–229

Publication history: Received on 15 September 2023; revised on 27 October 2023; accepted on 30 October 2023

Article DOI: https://doi.org/10.30574/wjarr.2023.20.2.2165

Abstract

Emphysematous cystitis is a rare urinary tract infection characterized by gas in the bladder wall and lumen. It is more common in diabetic unbalanced patients, who are immunocompromised or have an obstruction under the bladder. *The most common germs responsible for this pathology are facultative aerobic-anaerobes (Escherichia coli and Klebsiella pneumonia).*

Most cases can be treated with a combination of antibiotics, bladder drainage and glycemic control, Early medical intervention can contribute to achieving a favorable prognosis without the need for surgical intervention.

Keywords: Emphysematous; Cystitis; Bladder; Emergency

1. Introduction

The first case of pneumaturia was reported by E.L. Keyes in 1882 [1], and in 1961, H. Bailey described emphysematous cystitis based on human and animal autopsies [2]. Emphysematous cystitis is a rare form of urinary tract infection characterized by the spontaneous formation of gas within the bladder and/or the bladder wall.

It is an infectious complication secondary to the proliferation of both aerobic and anaerobic microbes. It occurs in diabetic patients in 60 to 70 percent of cases [4]. The prognosis, sometimes severe, depends on the timeliness of intervention.

2. Case Report

We present the case of a 67-year-old patient who experienced emphysematous cystitis.

2.1. Observation

This is a 67-year-old patient with a history of non-insulin-dependent diabetes on JANUMET 50MG/1000MG: 1 tablet in the morning and evening, and high blood pressure treated with LOSARTAN/HYD 100:25MG oral tablets: 1 tablet in the morning.

He was admitted to the emergency department for the management of a fever, which was recorded at 38.7°C, and asthenia that had been progressing for one week.

* Corresponding author: Zackaria B

On clinical examination, the patient was stable in terms of hemodynamics and respiration, well-oriented with a GCS (Glasgow Coma Scale) score of 15. He had diffuse abdominal tenderness, more pronounced in the lower abdomen. Blood pressure was measured at 140/90 mmHg, and the heart rate was 105 beats per minute.

Cardiopulmonary and neurological examinations did not reveal any specific findings. On a biological level, there were signs of inflammation with a CRP (C-reactive protein) level of 280 mg/L, leukocytosis with a white blood cell count of 12,000/mm^3, a PCT (procalcitonin) level of 2, and a creatinine level of 155 with an estimated glomerular filtration rate (eGFR) of 42. The urinary dipstick test revealed the presence of nitrites and strongly positive leukocytes.

An abdominopelvic CT scan without contrast injection showed the presence of air within the entire bladder wall. Emergency treatment included indwelling bladder catheterization, empirical antibiotic therapy with ceftriaxone, and insulin therapy. Urine cytobacteriological examination revealed sensitivity to E. coli, leading to a switch from ceftriaxone to Bactrim at an adjusted dose.

Two weeks later, an abdominopelvic CT scan was performed, showing complete resolution of the emphysema.

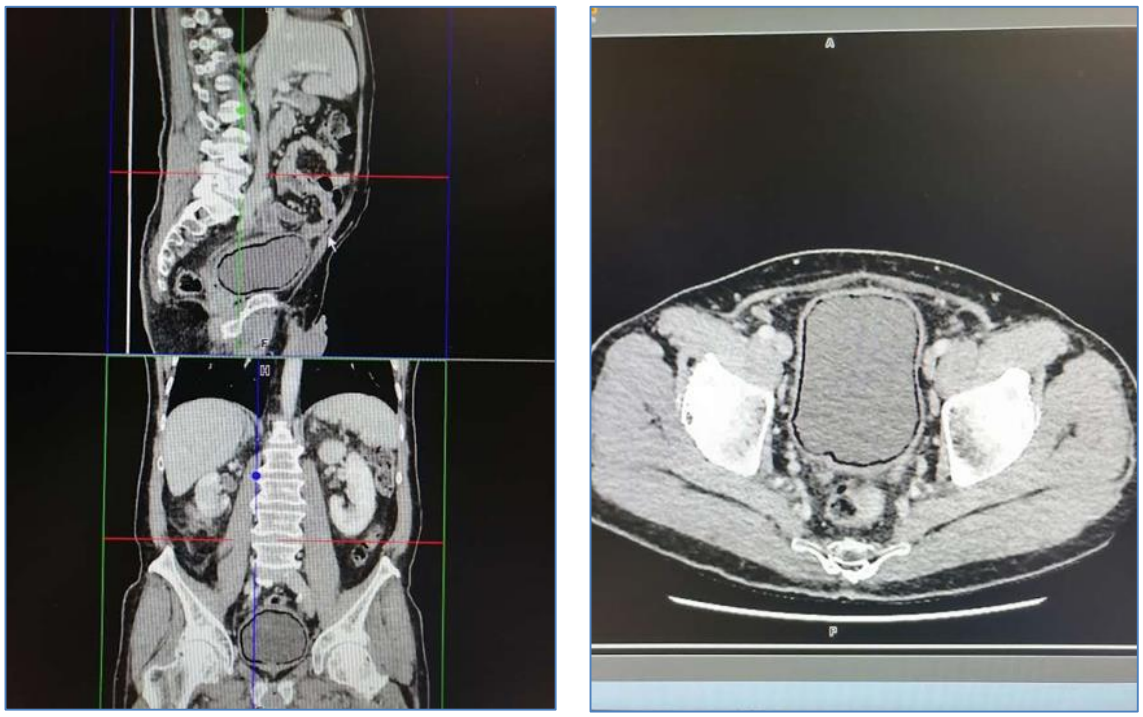

Figure 1 CT scan images demonstrating emphysematous cystitis

3. Discussion

Emphysematous cystitis is a rare condition defined by the presence of air within the bladder wall or within the bladder lumen. In the literature, the average age of patients with this condition is 70 years [1].

It is most commonly found in women, which is consistent with other urinary tract infections, with diabetes being a major contributing factor. Other predisposing factors include immunosuppression, malnutrition, and conditions that promote urinary stasis (autonomic neuropathy, prostate hypertrophy) [2].

The prevalence of emphysematous cystitis (CE) has significantly increased in recent decades, primarily due to the availability of more advanced imaging techniques [3]. While an unenhanced abdominal X-ray can reveal pneumaturia within the bladder lumen, abdominopelvic CT scan is the gold standard for diagnosing emphysematous cystitis. It also helps in ruling out differential diagnoses, including vesicovaginal or vesicodigestive fistulas [4].

The most common pathogens associated with CE are E. coli and Klebsiella pneumonia [2], [5].

Other microorganisms encountered include facultative aerobes like Enterobacter and Proteus mirabilis, and, more rarely, strict anaerobes such as Clostridium perfringens. Rare cases of emphysematous cystitis secondary to Candida albicans have also been reported [6].

The pathophysiology of emphysematous cystitis is not yet fully understood, and several hypotheses have been proposed:

The microbial proliferation by facultative aerobic-anaerobic and strict anaerobic bacteria leads to the production of gas through bacterial fermentation of glucose [7].

The presence of albumin in the urine can also serve as a substrate for bacteria.

All of these processes rely on a favorable environment with poor bladder emptying, as seen in cases of autonomic neuropathy or sub vesical obstruction that promotes bacterial proliferation [8].

The treatment for uncomplicated emphysematous cystitis is primarily medical, and its effectiveness depends on the promptness and efficacy of management. It involves broad-spectrum antibiotic therapy administered intravenously, urinary drainage through an indwelling catheter, and the stabilization of blood glucose levels. The duration of treatment varies depending on clinical and biological progress but is typically in the range of 3 to 6 weeks [9].

The most concerning complications of emphysematous cystitis include renal involvement with emphysematous pyelonephritis, which carries a high risk of septic shock, as well as necrosis of the bladder wall that can lead to rupture, necessitating partial or total cystectomy for management.

The prevalence of mortality is approximately 7% in emphysematous cystitis, whereas it is as high as 50% in cases of emphysematous pyelonephritis [1].

4. Conclusion

The symptomatology of emphysematous cystitis is atypical, and it's important to consider it in patients at risk who present with urinary tract infections and unusual symptoms.

Computed tomography is the gold standard for diagnosis and for assessing potential complications.

Prognosis depends on the timeliness of antibiotic treatment, bladder drainage, and the control of diabetes to prevent severe complications like sepsis and bladder rupture.

Compliance with ethical standards

Disclosure of conflict of interest

The authors declare that they have no conflicts of interest.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

References

[1] A. A. Thomas, B. R. Lane, A. Z. Thomas, E. M. Remer, S. C. Campbell, et D. A. Shoskes, « Emphysematous cystitis: a review of 135 cases », BJU Int., vol. 100, no 1, p. 17-20, 2007, doi: 10.1111/j.1464-410X.2007.06930.x.

[2] M. Grupper, A. Kravtsov, et I. Potasman, « Emphysematous Cystitis: Illustrative Case Report and Review of the Literature », Medicine (Baltimore), vol. 86, no 1, p. 47, janv. 2007, doi: 10.1097/MD.0b013e3180307c3a.

[3] A. A. Thomas, B. R. Lane, A. Z. Thomas, E. M. Remer, S. C. Campbell, et D. A. Shoskes, « Emphysematous cystitis: A review of 135 cases », BJU Int., vol. 100, no 1, p. 17-20, 2007, doi: 10.1111/j.1464-410X.2007.06930.x.

[4] D. E. Grayson, R. M. Abbott, A. D. Levy, et P. M. Sherman, « Emphysematous Infections of the Abdomen and Pelvis: A Pictorial Review », RadioGraphics, vol. 22, no 3, p. 543-561, mai 2002, doi: 10.1148/radiographics.22.3.g02ma06543.

[5] M. Amano et T. Shimizu, « Emphysematous Cystitis: A Review of the Literature », Intern. Med., vol. 53, no 2, p. 79-82, 2014, doi: 10.2169/internalmedicine.53.1121.

[6] D. P. Bartkowski et J. R. Lanesky, « Emphysematous Prostatitis and Cystitis Secondary toCandida Albicans », J. Urol., vol. 139, no 5, p. 1063-1065, mai 1988, doi: 10.1016/S0022-5347(17)42774-1.

[7] W.-H. Yang et N.-C. Shen, « Gas-Forming Infection of the Urinary Tract: An Investigation of Fermentation As a Mechanism », J. Urol., vol. 143, no 5, p. 960-964, mai 1990, doi: 10.1016/S0022-5347(17)40151-0.

[8] C. E. Hawtrey, J. J. Williams, et J. D. Schmidt, « Cystitis emphysematosa », Urology, vol. 3, no 5, p. 612-614, mai 1974, doi: 10.1016/S0090-4295(74)80259-1.

[9] F. Caron et al., « Practice guidelines for the management of adult community-acquired urinary tract infections », Médecine Mal. Infect., vol. 48, no 5, p. 327-358, août 2018, doi: 10.1016/j.medmal.2018.03.005.